

CLAIMS

1. A moving picture decoding method, which receives information on motion vectors, and performs motion compensation using recorded reference images and the information on the motion vectors to synthesize a predicted image,

the motion compensation having multiple block modes including a mode without motion vector decoding,

said method comprising:

a step of selecting a prediction mode representing the direction(s) of prediction;

a step of selecting a frame(s) to be referred to in each direction of prediction in the prediction mode from among multiple candidate reference frames; and

a step of selecting motion vector information used in the prediction mode.

2. A moving picture decoding method according to claim 1, wherein said step of selecting a reference frame(s) is performed after said step of selecting a prediction mode.

3. A moving picture decoding method according to claim 1, wherein said step of selecting a prediction mode is performed based on whether blocks adjacent to a current block have a motion vector.

4. A moving picture decoding method according to claim 3, wherein when the adjacent blocks have bi-directional motion vectors along the time axis or when

they have no motion vector, a bi-directional prediction mode is selected in said step of selecting a prediction mode, and when the adjacent blocks have one-way motion vectors along the time axis, a forward or backward prediction mode is selected in said step of selecting a prediction mode.

5. A moving picture decoding method according to claim 1, wherein said step of selecting a frame(s) to be referred to is a step of selecting one reference frame from multiple reference frames identified by index numbers, and when prediction in the selected direction is applied to the multiple adjacent blocks, a reference frame used for any one of the adjacent blocks is selected, when prediction in the selected direction is applied to only one of the multiple adjacent blocks, a reference frame corresponding to the index number used for the adjacent block is selected, or when the selected prediction mode is not applied to any of the adjacent blocks, a reference frame corresponding to index number 0 is selected.

6. A moving picture decoding method according to claim 5, wherein when prediction in the selected direction is applied to the multiple adjacent blocks, a reference frame having the smallest index number is selected from the reference frames applied.

7. A moving picture decoding method according to claim 3, wherein the adjacent blocks are three candidate blocks.

8. A moving picture decoding method according to claim 4, wherein the adjacent blocks are three candidate blocks.

9. A moving picture decoding method according to claim 1, wherein said step of selecting a motion vector(s) and said step of selecting a frame(s) to be referred to are performed on blocks different in size from each other.

10. A moving picture decoding method according to claim 1, wherein information for defining a prediction procedure performed when the mode without motion vector decoding is selected as a block mode is included in a header attached on a block basis.

11. A moving picture decoding method according to claim 10, wherein the information for defining a prediction procedure is information for selecting a prediction method for each block from multiple prediction methods for the mode without motion vector decoding.

12. A moving picture encoding method for multiplexing information on a difference between an input image and a predicted image synthesized using motion compensation with information on a motion vector(s) determined by the motion compensation, the motion compensation having multiple block modes including a mode without motion vector encoding, said method comprising:
a step of selecting a prediction mode

representing the direction(s) of prediction;

a step of selecting a frame(s) to be referred to in each direction of prediction in the prediction mode from among multiple candidate reference frames; and

a step of selecting motion vector information used in the prediction mode.

13. A moving picture encoding method according to claim 12, wherein said step of selecting a prediction mode is performed based on whether blocks adjacent to a current block have a motion vector.

14. A moving picture encoding method according to claim 13, wherein when the adjacent blocks have bi-directional motion vectors along the time axis or when they have no motion vector, a bi-directional prediction mode is selected in said step of selecting a prediction mode, and when the adjacent blocks have one-way motion vectors along the time axis, a forward or backward prediction mode is selected in said step of selecting a prediction mode.

15. A moving picture encoding method according to claim 12, wherein said step of selecting a frame(s) to be referred to is a step of selecting one reference frame from multiple reference frames identified by index numbers, and when prediction in the selected direction is applied to the multiple adjacent blocks, a reference frame used for any one of the adjacent blocks is selected, when prediction in the selected direction

is applied to only one of the multiple adjacent blocks, a reference frame corresponding to the index number used for the adjacent block is selected, or when the selected prediction mode is not applied to any of the adjacent blocks, a reference frame corresponding to index number 0 is selected.

16. A moving picture encoding method according to claim 15, wherein when prediction in the selected direction is applied to the multiple adjacent blocks, a reference frame having the smallest index number is selected from the reference frames applied.

17. A moving picture encoding method according to claim 13, wherein the adjacent blocks are three candidate blocks.

18. A moving picture encoding method according to claim 12, wherein said step of selecting a motion vector(s) and said step of selecting a frame(s) to be referred to are performed on blocks different in size from each other.

19. A moving picture encoding method according to claim 12, wherein information for defining a prediction procedure performed when the mode without motion vector encoding is selected as a block mode is included and multiplexed in a header attached on a block basis.

20. A moving picture decoding method according to claim 10, wherein when multiple methods are defined as the prediction procedure for the mode without motion vector encoding, the information for defining a prediction procedure is information for selecting one method for each block.

21. A moving picture decoding method, which receives information on motion vectors, and performs motion compensation using recorded reference images and the information on the motion vectors to synthesize a predicted image, the motion compensation having multiple block modes including a mode without motion vector decoding, wherein

a prediction procedure in the mode without motion vector decoding comprising: a step of selecting a prediction mode representing the direction(s) of prediction using decoded information; a step of selecting, using the decoded information, a frame(s) to be referred to in each direction of prediction in the prediction mode from among multiple candidate reference frames; and a step of selecting motion vector information used in the prediction mode using the decoded information.

22. A moving picture encoding method for multiplexing information on a difference between an input image and a predicted image synthesized using motion compensation with information on a motion

vector(s) determined by the motion compensation, the motion compensation having multiple block modes including a mode without motion vector encoding, wherein

a prediction procedure in the mode without motion vector encoding comprising: a step of selecting a prediction mode representing the direction(s) of prediction using coded information; a step of selecting, using the coded information, a frame(s) to be referred to in each direction of prediction in the prediction mode from among multiple candidate reference frames; and a step of selecting motion vector information used in the prediction mode using the coded information.